

# CLAIMS

What is Claimed is:

1. A method of hot swapping memory, comprising:
  - a) providing a spare memory bank in a memory system, wherein said memory system includes a plurality of memory banks such that a memory word is divided into said memory banks;
  - b) selecting one of said memory banks to replace;
  - c) configuring said memory system to perform write operations associated with said selected memory bank to both said selected memory bank and said spare memory bank;
  - d) performing atomic read and write operations such that content of said selected memory bank is copied to said spare memory bank; and
  - e) configuring said memory system to redirect operations to be performed on said selected memory bank to said spare memory bank such that said selected memory bank can be hot replaced.
2. A method as recited in Claim 1 further comprising:
  - f) replacing said selected memory bank with a functional memory bank;
  - g) configuring said memory system to perform write operations associated with said spare memory bank to both said spare memory bank and said functional memory bank;
  - h) performing atomic read and write operations such that content of said spare memory bank is copied to said functional memory bank; and
  - i) configuring said memory system to redirect operations to be performed on said spare memory bank to said functional memory bank.
3. A method as recited in Claim 1 further comprising:
  - f) replacing said selected memory bank with a functional memory bank;

g) selecting a particular memory bank of said memory banks and said spare memory bank to replace;

h) configuring said memory system to perform write operations associated with said particular memory bank to both said particular memory bank and said functional memory bank;

i) performing atomic read and write operations such that content of said particular memory bank is copied to said functional memory bank; and

j) configuring said memory system to redirect operations to be performed on said particular memory bank to said functional memory bank.

4. A method as recited in Claim 3 further comprising:

k) replacing said particular memory bank with a second functional memory bank;

l) selecting a second particular memory bank of said memory banks, said functional memory bank, and said spare memory bank to replace; and

m) repeating said steps h) to j) using said second functional memory bank in place of said functional memory bank and using said second particular memory bank in place of said particular memory bank.

5. A method as recited in Claim 1 further comprising:

comparing content of said selected memory bank with content of said spare memory bank such that correctable errors are ignored; and

if said comparing is successful, performing said step e).

6. A method as recited in Claim 5 wherein said comparing is dependent on an error correction code (ECC) scheme of said memory system.

7. A method as recited in Claim 1 wherein said memory system includes a repeater.

8. A circuit comprising a repeater coupled to a plurality of memory banks such that a memory word is divided into said memory banks and coupled to a spare memory bank, wherein said repeater directs write operations to be performed on a selected memory bank to both said selected memory bank and said spare memory bank, wherein after atomic read and write operations are performed such that content of said selected memory bank is copied to said spare memory bank, said repeater redirects operations to be performed on said selected memory bank to said spare memory bank such that said selected memory bank can be hot replaced.

9. A circuit as recited in Claim 8 wherein an unused memory bank of said memory banks is used in place of said spare memory bank.

10. A circuit as recited in Claim 8 wherein said selected memory bank is replaced with a functional memory bank, wherein said repeater directs write operations to be performed on said spare memory bank to both said spare memory bank and said functional memory bank, wherein after atomic read and write operations are performed such that content of said spare memory bank is copied to said functional memory bank, said repeater redirects operations to be performed on said spare memory bank to said functional memory bank.

11. A circuit as recited in Claim 8 wherein said repeater compares content of said selected memory bank with content of said spare memory bank such that correctable errors are ignored, and wherein said comparison operation is dependent on an error correction code (ECC) scheme associated with said plurality of memory banks and said spare memory bank.

12. A memory system comprising:

a plurality of memory banks such that a memory word is divided into said memory banks; and

a spare memory bank, wherein write operations associated with a selected memory bank are directed to both said selected memory bank and said spare memory bank, wherein atomic read and write operations are performed such that content of said selected memory bank is copied to said spare memory bank, and wherein operations to be performed on said selected memory bank are redirected to said spare memory bank such that said selected memory bank can be hot replaced.

13. A memory system as recited in Claim 12 wherein an unused memory bank of said memory banks is used in place of said spare memory bank.

14. A memory system as recited in Claim 12 wherein said selected memory bank is replaced with a functional memory bank, wherein write operations associated with said spare memory bank are directed to both said spare memory bank and said functional memory bank, wherein atomic read and write operations are performed such that content of said spare memory bank is copied to said functional memory bank, and wherein operations to be performed on said spare memory bank are redirected to said functional memory bank.

15. A memory system as recited in Claim 12 wherein content of said selected memory bank is compared with content of said spare memory bank such that correctable errors are ignored, and wherein said comparison operation is dependent on an error correction code (ECC) scheme associated with said plurality of memory banks and said spare memory bank.

16. A memory system as recited in Claim 12 further comprising a repeater coupled to said memory banks and to said spare memory bank.

17. A computer system comprising:

a memory system including a plurality of memory banks such that a memory word is divided into said memory banks, a spare memory bank, and a repeater coupled to said memory banks and said spare memory bank, wherein write operations associated with a selected memory bank are directed to both said selected memory bank and said spare memory bank, wherein atomic read and write operations are performed such that content of said selected memory bank is copied to said spare memory bank, and wherein operations to be performed on said selected memory bank are redirected to said spare memory bank such that said selected memory bank can be hot replaced.

18. A computer system as recited in Claim 17 wherein an unused memory bank of said memory banks is used in place of said spare memory bank.

19. A computer system as recited in Claim 17 wherein said selected memory bank is replaced with a functional memory bank, wherein write operations associated with said spare memory bank are directed to both said spare memory bank and said functional memory bank, wherein atomic read and write operations are performed such that content of said spare memory bank is copied to said functional memory bank, and wherein operations to be performed on said spare memory bank are redirected to said functional memory bank.

20. A computer system as recited in Claim 17 wherein content of said selected memory bank is compared with content of said spare memory

bank such that correctable errors are ignored, and wherein said comparison operation is dependent on an error correction code (ECC) scheme associated with said plurality of memory banks and said spare memory bank.